BELLCOMM, INC.
955 L'ENFANT PLAZA NORTH, S.W. WASHINGTON, D. C. 20024

SUBJECT: Goldstone and Parkes Visibility of Lunar Landing Sites - Case 310

DATE: April 1, 1969

FROM: D. R. Anselmo

MEMORANDUM FOR FILE

The visibility of lunar surface egress using the 210 foot antennas at Goldstone and Parkes has been uncertain for the first lunar mission opportunities since there has been considerable uncertainty in the exact surface egress times. The uncertainty in egress time arises from a number of variables; hybrid versus free return profiles, lunar orbit timelines, lunar surface timelines, and the lunar lighting constraint. The first landing will be made with the sun elevation in the 5 to 20 degree region and it is highly probable that it will be in the region from 5 to 13 degrees. It is possible to identify for each lunar landing site the time period during which the sun elevation meets the above constraint and for this time period examine the visibility from the 210 foot antennas. The attached figure gives this information in graphical form for the Apollo landing sites from June through December of 1969. The Parkes data shown is that coverage which supplements the Goldstone coverage; the overlap has not been shown. The Parkes antenna pointing constraint of a maximum angle of 60 degrees from zenith has been taken into account in this data.

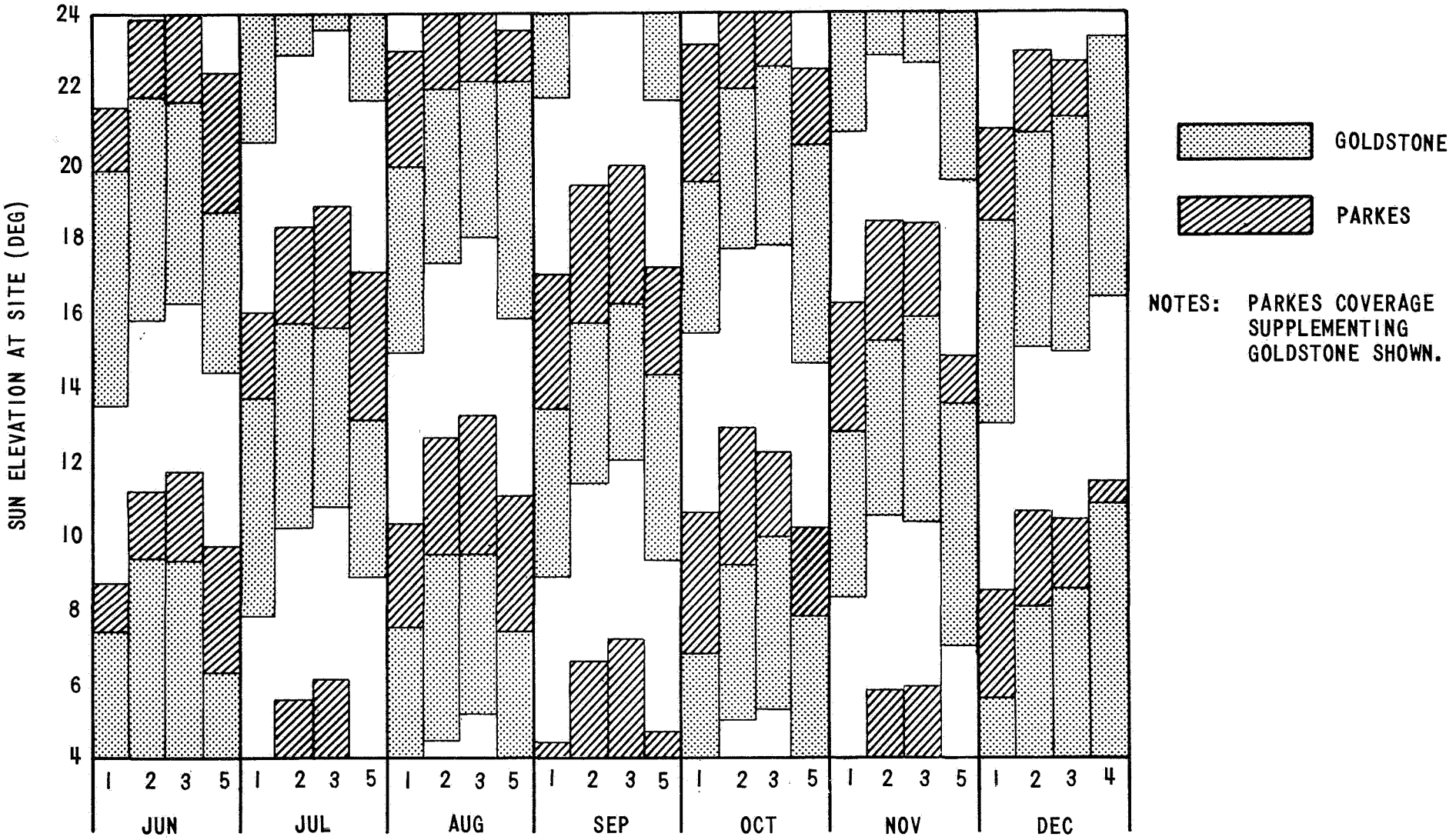
With knowledge of the sun elevation at touchdown, and the fact that sun elevation increases at approximately 1/2° per hour this graph can be used to determine 210 foot antenna visibility for any lunar surface timeline. Note that launch date, transit time, and lunar orbit time prior to descent need not be considered.

D. R. Anselmo

2013-DRA-srb

Attachment

APOLLO LANDING SITE VISIBILITY FROM 210 FT ANTENNAS



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